AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) An image analysing focusing device for an infrared optical apparatus (10) comprising controllable optical convergence means (20), image detection means (30) onto which the optical convergence means (20) is projecting an image of an object, processing means (40) for processing signals from the image detection means (30) to provide control signals to control the optical convergence means (20) to focus the image of the object onto the image detection means (30), characterised by

search operation means (140) in the processing means (40) analysing the image on the image detection means (30) to find at least one image window in the image for which a focusing is to be done in accordance with predetermined conditions; and

a focusing function means (150) in the processing means (40) providing a focusing on the at least one image window based on providing as distinct differences between individual detecting positions (pixels) within the image window as possible using an iterative process;

wherein the image analyzing focusing device is constructed and arranged to operate in the infrared range.

2. (original) Device as claimed in claim 1, characterised in that the focusing function means, (150) divides the focusing in coarse focusing using a focus measure function, FMF based on low spatial frequencies in the image and fine focusing using an FMF based on high spatial frequencies in the image.

3. (original) Device as claimed in claim 2, characterised in that the coarse focusing is done by analysing the FMF with a "hill-climbing" technique and the fine focusing is done by analysing the FMF with a "curve-fitting" technique.

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4. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions provide options:

to choose a focus window area of the image detection means (30), other than the most centrally situated area;

to store acquired focus images digitally in a memory location (160) of the processing means (40); and

to combine the device with various kinds of supporting semi-automatic or fully automatic decision-making systems.

5. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions for finding the image window comprise a coupling of the device to a sensor instrumentation (100) enabling focusing on objects within the imaged view area depending on their thermal properties.

6. (original) Device as claimed in claim 5, characterised in that the sensor instrumentation (100) is used while monitoring predetermined temperature differences or changes within the image window.

7. (original) Device as claimed in claim 5, characterised in that the predetermined conditions comprise providing the sensor instrumentation (100) with a radiometric calibration device (110).

8. (original) Device as claimed in claim 7, characterised in that the sensor instrumentation (100) and the radiometric calibration device (110) are used while monitoring predetermined temperatures or temperature intervals within the image window.

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9. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions comprise semi-automatic or fully automatic calibration of the relation between of at least two of the following parameters:

distance from the apparatus (10) to a viewed object;

temperature of the optical convergence means (20); and

focus position of the optical convergence means (20),

which calibration is supported by the automatic focusing.

10. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions comprise estimation of a distance from the apparatus (10) to a viewed

object based on information on temperature and/or position of the optical convergence means (20).

11. (original) Device as claimed in claim 10, characterised in that the predetermined conditions comprise estimation of a distance from the apparatus (10) to a viewed object based on information on temperature and/or position of the optical convergence means (20) comprising at least one of the options:

presenting estimated distance to the viewed object;

presenting inaccuracy of the estimation;

presenting a combination of the above estimated distance and inaccuracy;

presenting data only when the search operation means (140) has obtained an acceptable focus position.

12. (original) Device as claimed in claim 10, characterised in that an estimation of the temperature of a viewed object is done based on information on an estimation of distance from the apparatus (10) to a viewed object provided by the calibration device (110), optics temperature and/or position of the optical convergence means (20).

13. (original) Device as claimed in claim 12, characterised in that an estimation of the temperature of a viewed object is done based on information on a distance from the apparatus (10) to a viewed object, optics temperature focus

position of the optical convergence means (20) comprising at least one of the options:

presenting estimated temperature of the viewed object;

presenting inaccuracy of the estimation;

presenting a combination of the above estimated temperature and inaccuracy;

presenting data only when the search operation means (140) has obtained an acceptable focus position.

14. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions for finding the image window comprise coupling to a movement detection device (130) which coupling enables focusing on moving objects, by means of the focusing function means (150), whereby the focus window is movable across the image and follows the moving object in the window during the focusing.

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15. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions for finding the image window comprise correlation of a geometrical object in the image with a pre-defined geometrical object in the focusing function means (150) prior to focusing on the particular geometrical object of the viewed image.

16. (currently amended) Device as claimed in claim 15, characterised in that the focusing function means (150) for correlation comprises the geometrical objects as 2-dimensional

electronic images supplied via ~~for instance a PC-card or another~~ an information transmitting means.

17. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions comprise a calculation by the focusing function means (150) of possible ranges for the focus position at a certain temperature, whereby image analysis in impossible intervals can be omitted and processing capacity reduced.

18. (previously presented) Device as claimed in claim 1, characterised in that the predetermined conditions comprise control by the focusing function means (150) to adjust the focus position to infinity when no object to focus on can be found within the viewed image.

19. (previously presented) Device as claimed in claim 1, characterised in that the device is used in a pan-tilt type of equipment where the processing unit (40) controls a repeated sequence of movements between pre-defined objects or focus windows within the viewed image and may send notification messages in response to predetermined trigger conditions.

20. (original) Device as claimed in claim 19, characterised in that the pan-tilt equipment in the processing unit (40) includes a register (160) of preceding focus data used for adjusting the focus position or a nearby focus position already during the moving from one viewed area to the next area

to be viewed, whereby the focusing is obtained faster leading to more efficient operation.

21. (original) Device as claimed in claim 19, characterised in that the predetermined trigger conditions comprise for instance thermal conditions and/or object movements within a pre-defined area.

22. (previously presented) Device as claimed in claim 1, characterised in that it may be used in combination with or be equipped with an integrated semi-automatic or fully automatic zooming device.

23. (previously presented) Device as claimed in claim 1, characterised in that it may be used in combination with or may be equipped with an integrated position determining device, such as a global positional system, GPS, whereby the processing means (40) may calculate and present positions of viewed objects relative to positional data from the GPS.

24. (currently amended) An image analysing focusing method for an infrared optical apparatus (10) comprising controllable optical convergence means (20), image detecting means (30) onto which the optical convergence means (20) is projecting an image of an object, processing means (40) for processing signals from the image detecting means (30) to provide control signals to control the optical convergence means (20) to focus the image of the object onto the image detecting means (30), characterised by

analysing the image on the image detecting means (30) to find at least one image window in the image for which a focusing is to [[de]] be done in accordance with predetermined conditions; and

providing a focusing on the at least one image window based on providing as distinct differences between individual detecting positions (pixels) within the image window as possible using an iterative process;

wherein the focusing is performed using light in the infrared range.

25. (original) Method as claimed in claim 24, characterised in that the focusing is divided into a coarse focusing step using FMF based on low spatial frequencies in the image and a fine focusing step using FMF based on high spatial frequencies in the image, whereby the two focusing steps may be combined for an optimum result.

26. (original) Method as claimed in claim 24, characterised in that the coarse focusing is done by analysing the FMF with a "hill-climbing" technique and the fine focusing is done by analysing the FMF with a "curve-fitting" technique.

27. (previously presented) Method as claimed claim 24, characterised in that the predetermined conditions of the focusing comprise use of a focus function of the form $FMF(z) = \frac{1}{N}\sum\left(K \otimes I_z - m\right)^2$, where K is an operator, N a factor of normalisation and m is a variable.

28. (original) Method as claimed in claim 27, characterised in that the operator values of the focus function comprise: K= [1 1 1], K=[1-1], K= [10-1] and K=[1].

29. (original) Method as claimed in claim 28, characterised in that use of the operator values of the focus function is made with a variation depending on individual requirements of each system, for instance by applying the operator functions in more than one direction in the image.

30. (currently amended) Method as claimed in claim 24, ~~characterised by its application in any of the following technical fields, although also many other technical fields are conceivable~~ wherein the method is applied to perform at least one of the following functions:

inspection of electrically operating devices;

temperature related process inspection, monitoring and surveillance;

medical, chemical, petrochemical and furnace inspection, ~~some of which can be done using hand-held and/or mobile units mounted in vehicles, helicopters~~;

research and development~~, especially related to the electronics industry and components manufacturing~~;

human, civilian and military surveillance.

31. (new) The image analyzing focusing device of claim 1, wherein the iterative process is a variable iterative process that operates so as to maximize contrast.

32. (new) The image analyzing focusing device of claim 31, wherein the variable iterative process is selected based on spatial frequencies of the image.

33. (new) The image analyzing focusing method of claim 24, wherein the iterative process is a variable iterative process that operates so as to maximize contrast.

34. (new) The image analyzing focusing method of claim 33, wherein the variable iterative process is selected based on spatial frequencies of the image.